AWRI Australian Wine Research Institute

Fact Sheet
VITICULTURE

Managing mealybugs

Longtailed mealybug on grapevine leaf. Photo courtesy of Scott Paton (Nutrien Ag Solutions).

Introduction

Mealybugs are not normally considered to be a significant pest in wine-grapes. Conventional thinking is that numbers are kept in check by a diverse range of natural enemies unless something (such as the use of a broad-spectrum insecticide) disrupts them. If mealybugs are infesting wine-grapes and causing significant damage, it is worth considering what may have interrupted the natural balance.

Decisions about mealybug control should be based on monitoring results, natural predator populations, as well as current and forecast weather conditions. Mealybugs are susceptible to prolonged periods of hot weather. Only when monitoring indicates that an action threshold has been reached should chemical control options be considered.

Natural enemies

Mealybugs provide a food source or egg host for a number of natural enemies. These include:

- The parasitic wasp species *Anagyrus fusciventris* (found in many warm irrigated districts), *Tetracnemoidea brevicornis* and *Ophelosia* spp.
- Green lacewings (*Mallada signatus*)*
- The predatory fly *Diadiplosis koebeli*.
- Some spiders
- Ground beetles, including *Geoscaptus* species and *Promocoderus* species

- Larvae and adults of ladybird species including the transverse ladybird (*Coccinella transversalis*), mealybug-destroyer ladybird (*Cryptolaemus montrouzieri**), minute two-spotted ladybird (*Diomus notescens),* common spotted ladybird (*Harmonia conformis*), spotted amber ladybird (*Hippodamia variegata*)
- Rove beetles
- Hoverflies
- Brown lacewing or Tasmanian lacewing (*Micromus tasmaniae*)

**Cryptolaemus* ladybirds and green lacewings are available from insectaries in eastern Australia.

Biological control and cultural practices

Providing habitat and food sources for parasites and predators of mealybugs may help maintain beneficial populations when mealybugs are scarce. Some cover crops and flowering plants provide pollen and nectar. It is also important to minimise the use of agrochemicals that affect beneficial species.

The obvious presence of ants on a grapevine often indicates a sap-sucking insect is at work. Ants will actively 'farm' and protect mealybugs from predators, in order to feed on the honeydew that mealybugs secrete. To discourage ants, keep canes from touching the ground. Chemical sprays applied to the base of vines and trellis supports can be used to block their access pathways into the vine framework but it is better to control the mealybug in the first instance.

Bunches and leaves that are touching the trunk or cordon are more likely to have mealybug. Try and minimise this occurring in the canopy.

Action threshold

If general infestation levels exceed a threshold of 10% of the 100 leaves or bunches sampled, it may be necessary to use a chemical control option. However, the decision should be balanced against the potential for hot weather and natural predators to decrease the mealybug population. This should also be considered in relation to winery tolerance for mealybug contamination.

Chemical control

Table 1 provides a guide to all registered chemical options for mealybugs. Check the product label for appropriate use in your vineyard, as registrations vary between states and between mealybug species. While spraying is not generally required for control of mealybug on wine-grapes, if significant economic loss has been experienced in previous seasons and present season conditions (temperatures ~ 25°C and high humidity) favour mealybug development, chemical control may be warranted.

The use of broad-spectrum insecticides is generally not recommended in integrated pest management (IPM) programs because of the impact on beneficial insects. Any chemical application should be carefully timed and targeted. If the predator population is reduced, the overall result may be that mealybug numbers are worse later in the season or in subsequent seasons.

If the decision is made to apply a chemical option:

- spray an appropriate registered chemical when nymphs are observed in large numbers
- target the juvenile life stages, as adult mealybugs are protected by their waxy coating and are less vulnerable.

Dormancy spray

The purpose of a vine dormancy spray is to target overwintering adult mealybugs. The population is well sheltered under bark at this time, and therefore good spray coverage is essential. The spray unit should be set up to deliver a high water rate that saturates the trunk and cordon.

Growing season spray

Mealybugs are not equipped to move far within a vineyard, even with the help of ants. Identifying hotspots and then controlling infested areas is recommended. Where practical, target individual vines or patches of vines identified as sites of infestation using a high-pressure hand spray gun. If it is necessary to use machinery to cover larger areas, ensure good spray penetration into sheltered parts of canopies. Be aware that vineyard machinery is considered to be a possible avenue for mealybug spread. Accordingly, consider undertaking machinery operations in clean blocks prior to mealybug-infested blocks where possible.

Chemical resistance

Resistance to parathion by mealybugs has been reported overseas.

Chemical control options

The following table lists registered control options with restrictions on use for export wines. Check the product label for appropriate use in your vineyard as registrations vary between states and between mealybug species. It is recommended that you contact your winery or grape purchaser prior to any 1B insecticide application.

Table *1.* Active constituents registered for use against mealybug insects in Australia, the label and export wine withholding period (WHP) and comments on their use. The table is arranged in order of the label WHP from dormancy to harvest. Growers must follow label directions unless a current APVMA permit applies. It is recommended that growers consult with their winery/grape purchaser about any specific chemical use restraints.

Active constituent (some registered products)	Label withholding period - can be followed for domestic wine production	Withholding period for export wine	Comments
paraffinic oil petroleum oil	Dormancy application.	Dormancy application.	• Summer and winter oils work by suffocating insects, so thorough coverage of the crown, cordons and spurs is required.

(BioPest, CropCover, D-C-Maax nC24, isoCLEAR HPO, Trump Spray Oil)			• They are phytotoxic to vines and should only applied during full dormancy. • A recapture spray unit may reduce off-target losses while facilitating the drenching of the dormant vine.
clothianidin (Samurai)	Use no later than E-L 19, about 16 leaves separated, beginning of flowering (first flower caps loosening).	Contact your winery/grape purchaser prior to application.	• This is a soil application delivered through irrigation systems. • If undervine sprinklers are used, the chemical can be applied by band spraying followed by thorough wetting of the banded area. • The soil in the irrigation zone should be free of weeds and heavy debris. • Clothianidin is not compatible with integrated pest management (IPM) programs using beneficial arthropods. • It is highly toxic to bees, with bee brood development also harmed by exposure to residues. Bee mortality is also most likely if bees drink from irrigation water or dew on the ground after irrigation. • Do not apply if heavy rains are expected within 48 hours. • Do not apply more than one soil application per block per season.
buprofezin (suppression only) (Applaud, Uptown, Buprofezin 440, Scale & Bug)	Use no later than E-L 25, 80% capfall.	Use no later than E-L 25; 80% capfall.	• Monitor crops from budburst and spray when crop monitoring indicates the first onset of crawler release. • Do not target applications on populations that are well-established where mature adult insects dominate the population. • Apply as a dilute (high volume spray) to the point of run-off. Dilute spraying is important, as thorough coverage is critical for control.
sulfoxaflor (Transform)	Use no later than E-L 25, 80% capfall.	Contact your winery/grape purchaser prior to application.	• Best control is obtained by making two spray applications (14-21 days apart) early in the season, targeting crawlers. • Complete spray coverage is essential; apply to the point of run-off. Concentrate spraying is not recommended. • Sulfoxaflor is highly toxic to bees and harmful to bee brood. It may also harm parasitic wasps used as part of IPM.

acetamiprid + pyriproxyfen (Trivor)	Use no later than E-L 31, berries pea-size (7 mm diameter).	Use no later than E-L 19, about 16 leaves separated, beginning of flowering (first flower caps loosening).	• Monitor crops from budburst and spray when crop monitoring indicates the first onset of crawler release. For best results, apply from early in the season when crawlers are active and good coverage can be achieved. • Do not target applications on populations that are well-established where mature adult insects dominate the population. • Apply as a high volume spray to the point of run-off, ensuring thorough coverage. Dilute spraying is important, as thorough coverage is critical for control.
spirotetramat (Movento 240 SC, Viento 240)	Use no later than 4 weeks before harvest	Use no later than E-L 18, 14 leaves separated, flower caps still in place, but cap colour fading from green.	• Monitor crops following budburst and commence applications at the onset of crawler emergence. • Foliage is required to take up the chemical, so do not apply prior to E-L 13. Continue to monitor crops and apply a second application 21-28 days later if necessary. • Applications to an established pest population where mature adults are present and dominate the population will be ineffective.
diazinon	Use no later than 14 days before harvest.	Contact your winery/grape purchaser prior to application.	• Recommended to spray during late November/early December. • Diazinon is dangerous to bees. • Thorough coverage is essential.
maldison/malathion (Fyfanon 440 EW, Hy-Mal)	Use no later than 3 days before harvest.	Contact your winery/grape purchaser prior to application.	• Spot-spray where possible to minimise the impact on off-target species. Time sprays to coincide with crawler emergence if beneficial insect numbers are low.

Acknowledgement

This work was supported by Wine Australia, with levies from Australia's grapegrowers and winemakers and matching funds from the Australian Government. The AWRI is a member of the Wine Innovation Cluster in Adelaide, SA.

Much of the information in this fact sheet was first published by the Cooperative Research Centre for Viticulture (CRCV) in VitiNote format. AWRI would like to acknowledge the Cooperative Research Centre for Viticulture (CRCV) and all involved in the VitiNotes series (1996 - 2006). Alex Sas (Wine Australia) is thanked for his contributions to this fact sheet.

Further reading

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Monitoring mealybugs vitinote: Available from: https://www.awri.com.au/wp-content/uploads/mealybug_monitoring.pdf

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Contact

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